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AN OUTLINE

OF THE

Technique of Abdominal and Pelvic Operations

AS PERFORMED IN THE MEDICO-CHIRURGICAL HOSPITAL
OF PHILADELPHIA.

BY

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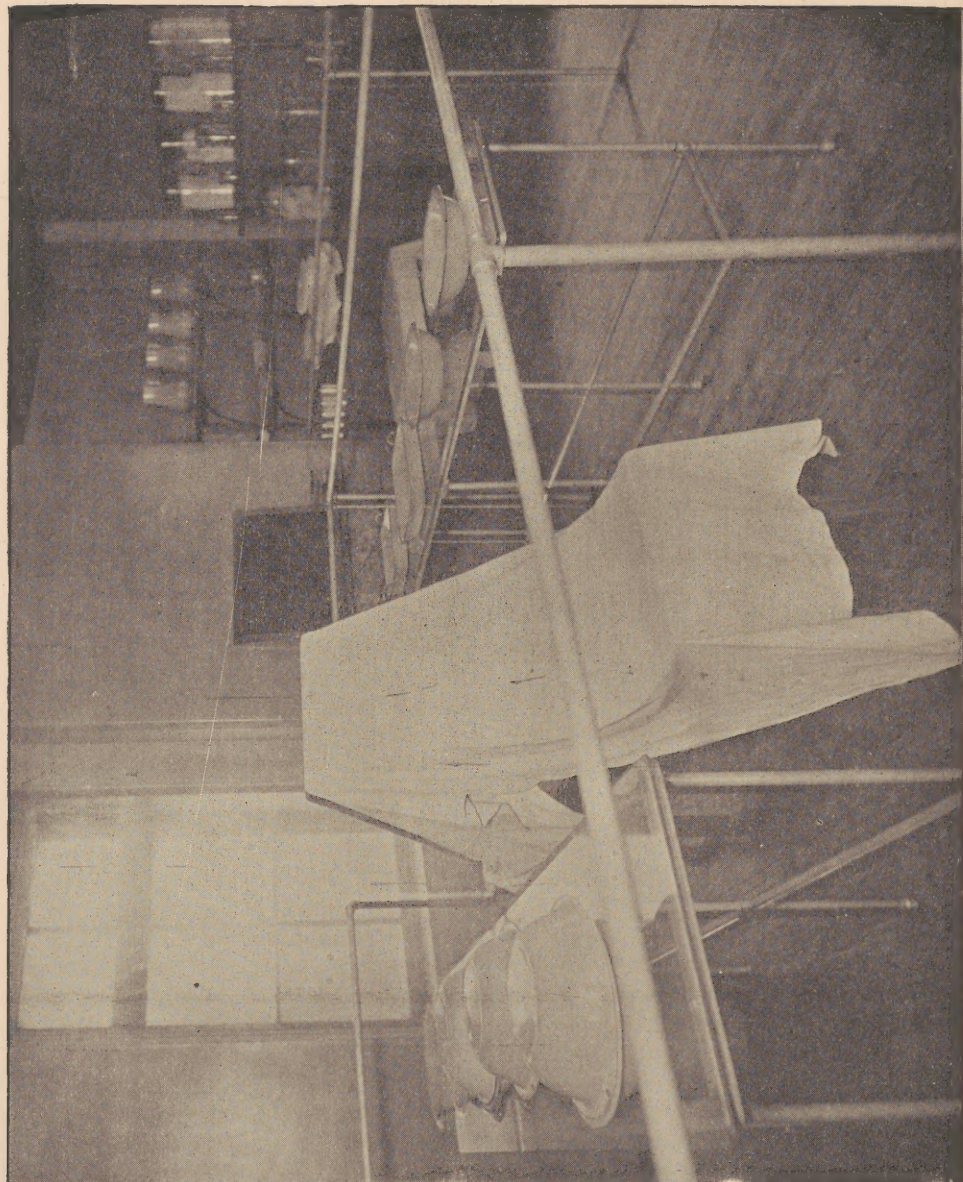


FIG. 1.—Shows the field of operation, around which is seen the iron railing, and beyond is shown the corner of the room containing the supplies.

An Outline of the Technique of Abdominal and Pelvic Operations

AS PERFORMED IN THE MEDICO-CHIRURGICAL HOSPITAL OF PHILADELPHIA.

BY WILLIAM EASTERLY ASHTON, M.D.,

Professor of Gynecology in the Medico-Chirurgical College of Philadelphia.

IT is my purpose in this paper to give a concise description of the operative technique in abdominal surgery as carried out in the Medico-Chirurgical Hospital.

With this object in view, I shall present my methods as follows:—

1. The preparatory treatment of the patient.
2. The post-operative treatment.
3. The surgeon, assistants, and nurses.
4. The operating-room.
5. The instruments, ligatures, sutures, gauze, and dressings.

1. THE PREPARATORY TREATMENT OF THE PATIENT.

In all cases, except when operative interference is immediately demanded, the patient is placed under careful and systematic treatment for seven days prior to abdominal section. This treatment consists of rest, bathing, care of the bowels, regulation of the diet, special antiseptic preparations immediately before operation and precautions against shock and vomiting. During the time the patient is being thus prepared for operation a careful and thorough examination is made of the lungs, heart, and kidneys.

Rest.—By rest we mean that the patient is confined to bed during the entire preparatory period, excepting, of course, the time consumed in taking the daily bath. The bed-pan is used, as the patient is thus trained to empty the bladder and bowels in the recumbent position.

Bathing.—A general and local bath is given daily. This consists in the use of

warm water with soap and using a flesh-brush over the entire surface of the body, thus thoroughly removing all exfoliated epithelium and sebaceous matter. Especial care is taken in cleansing the abdomen, upper part of the thighs, umbilicus, and genital organs. While in the bath the vagina is irrigated with water and soap. After the bath a vaginal injection of corrosive-sublimate solution (1 to 4000) is given and the abdomen, upper portion of the thighs, and external organs sponged with the same antiseptic. When the condition of a patient is such that the bath cannot be taken in a tub, it is given in bed, and the mattress protected with rubber sheeting. The flesh-brush is always sterilized, after being used, by boiling, and then placed in a solution of corrosive sublimate (1 to 1000); each patient has a separate brush.

Care of the Bowels.—To prepare the intestinal tract for an operation, I use laxatives and the sulphate of strychnia. The granular effervescent sulphate of magnesia (manufactured by Ashbridge & Co., Philadelphia) is given in teaspoonful doses every hour, until five or six free movements are produced. It is then given daily, in sufficient quantities to secure a bowel movement once in every twenty-four hours. Two teaspoonfuls in the morning are usually sufficient for this purpose. The effervescent salt is more palatable and better borne by the stomach than the ordinary preparation of the sulphate of magnesia. If the patient is unable to take salts, I use calomel, beginning with 5 grains and following it with $\frac{1}{2}$ grain every hour until free evacuations occur. The bowels are then kept open

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daily with an enema. This consists of one pint of warm soap water, a heaping tablespoonful of the sulphate of magnesia (not the effervescent), and a teaspoonful of the spirits of turpentine. Should the bowels not move within thirty minutes after the use of this enema, an ounce of pure glycerin is then injected into the rectum. The day before operation an extra quantity of salts is given and an enema the following morning, so as to secure a thorough cleaning out of the bowels.

The sulphate of strychnia ($\frac{1}{15}$ grain) is given hypodermically, three times daily, during the seven days of preparatory treatment. Although this may seem a large dose of the drug to administer, yet I have never seen any ill effects follow its use, if carefully watched. Strychnia not only stimulates the heart and nervous system, thus lessening the danger of operative shock, but it also keeps the intestines well contracted. We have now employed it in a large number of cases, with the result of practically preventing the development of post-operative shock and tympany. I therefore look upon this drug as a most important part of the preparatory treatment of an abdominal section.

Regulation of the Diet.—During the entire period of preparation the patient is given a soft diet. This consists of milk, clear soups,—such as consommé, bouillon; mutton-, beef-, or chicken- broths; soft-boiled eggs, oatmeal, milk-toast or soft toast, and koumyss. Alcoholic stimulants are not given unless there exists a special indication for their use. The object of placing the patient upon this diet is to have the intestines as empty as possible at the time of operation, and also to place the stomach in the best possible condition by giving only easily-digested foods.

Special Antiseptic Preparations Immediately Before Operation.—A general bath is given on the morning of the day of operation and the hair shaved from the pubes. The manner of giving this bath has already been described. After the patient comes out of the tub the thighs and abdomen are thoroughly rubbed with alcohol, after which they are sponged with a sublimate solution (1 to 1000); the vagina is then irrigated with the same

antiseptic. The lower extremities are now inclosed in sterilized flannel stockings, and a thick pad of aseptic gauze is placed over the abdomen. A sterilized sheet is then wrapped around the patient, extending from the chest to the knees and securely fastened in front with safety-pins. This dressing remains in position until the patient is placed upon the operating-table. The pins holding the sheet are then unfastened, the gauze pad removed, sterilized towels placed around the seat of operation, and the abdomen washed with ether. The upper extremities are kept out of the way by flexing the forearm upon the arm and securing the wrist-band of the night-gown to the shoulder of the garment by means of safety-pins.

Precautions Against Shock and Vomiting.—Immediately before administering the anæsthetic the patient is given a hypodermic injection of morphia, gr. $\frac{1}{6}$, and sulphate of strychnia, gr. $\frac{1}{15}$. The use of these drugs lessens the tendency to post-operative shock and vomiting.

2. THE POST-OPERATIVE TREATMENT.

Diet—Drink.—Nothing is given by the mouth for the first twenty-four hours, after which time, if the stomach be quiet, the patient is allowed a liquid diet. I am very partial to koumyss under these circumstances, as it agrees well with most cases; a clear broth, or one of the beef-extracts is also used. Milk is not given unless peptonized, as it is apt to cause intestinal flatus. As a drink I use small quantities, frequently repeated, of soda-water or ordinary water which has been boiled. After the bowels are moved the diet is cautiously increased, and in a few days my patients are allowed anything they may desire which is not in itself liable to disorder the digestion. Whisky, brandy, and champagne are given as stimulants when indicated.

I never allow anything to be taken by the stomach as long as there is irritability remaining from the anæsthetic. If the patient complain of thirst, from 4 to 6 ounces of warm water are injected into the rectum and repeated every three hours. I most earnestly condemn the use of anything given by the mouth to arrest sick stomach, except it be a dry champagne,

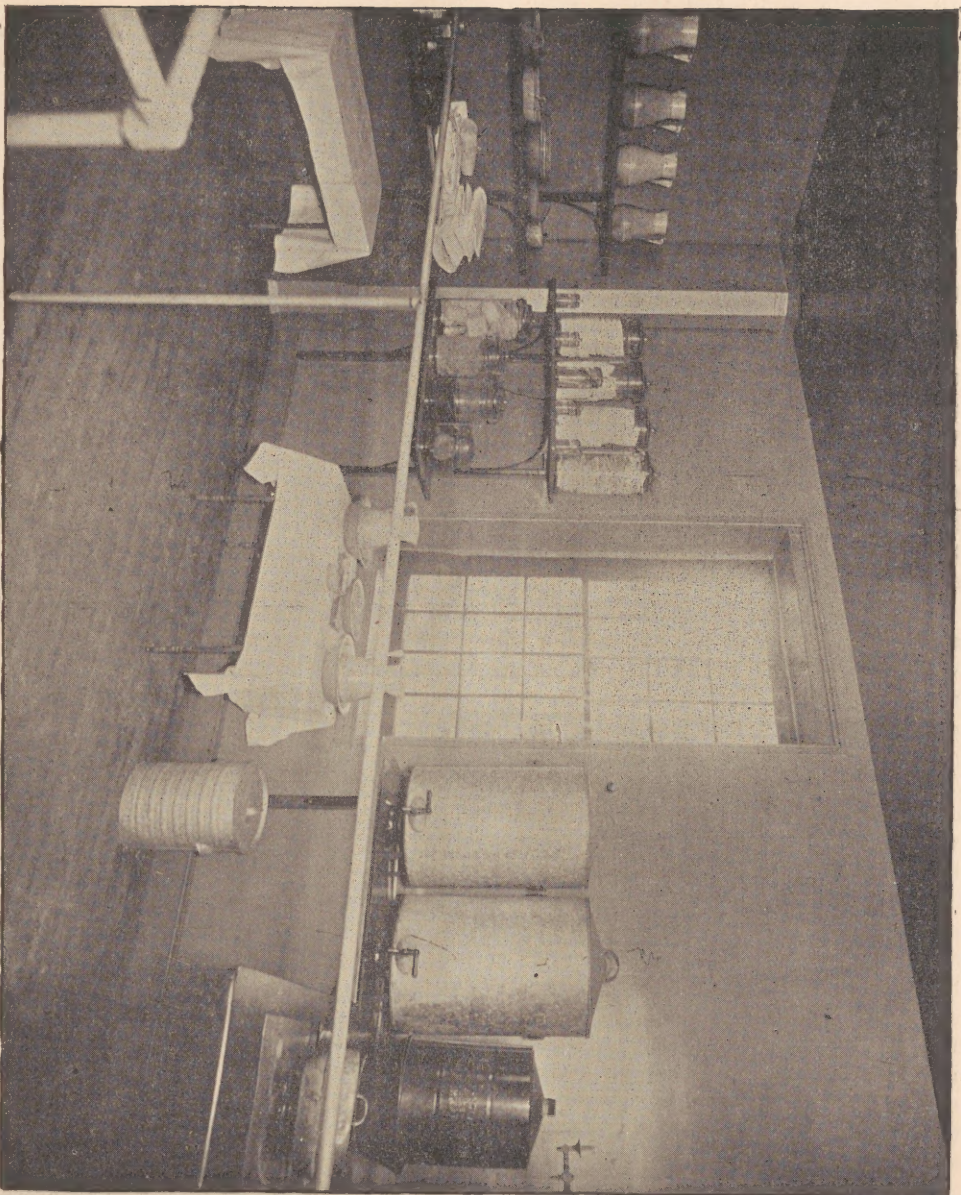


FIG. 2.—The end of the room containing the supplies, tanks, Arnold's sterilizer, gas stove and tray, and under the window the table where the surgeon and his assistants prepare the hands and forearms for operation. The railing seen in front separates this part of the room.

which has a good effect in those cases where nausea is prolonged beyond twenty-four hours. What nature needs is rest, and the irrational plan of flooding the stomach with all sorts of remedies only serves to make worse the condition already existing. In cases in which the nausea continues beyond twenty-four hours, the patient is given an enema of 4 ounces of peptonized milk or beef-juice every three hours. These enemata are continued until food can be taken by the stomach.

The Bowels.—Beginning twenty-four hours after operation, a teaspoonful of the effervescent sulphate of magnesia is administered every hour until eight doses are taken, when the rectal injection already referred to is given. This is generally followed by a free, watery movement of the bowels. If the stomach be irritable, calomel is used in place of the salts, beginning with 5 grains, and then giving $\frac{1}{2}$ grain every hour until 4 grains are taken, when the enema is administered. After the bowels have been freely moved they are kept open daily by the use of an enema and an occasional dose of salts.

Length of Time in Bed.—The patients are kept in bed until the end of the third week, and in four weeks they are allowed to return home. It is a mistake to keep a patient lying in bed too long in one position. My rule, in cases not requiring drainage or the extra-peritoneal treatment of a stump or of a portion of the abdominal viscera, is to change the position from the back to the side after the first twenty-four hours. I do not mean by this that the patient is allowed to roll from side to side at will, but to have the nurse raise the body, by placing her hands under the shoulder and hip, and slipping a soft pillow beneath. After some little time the pillow may be removed and placed under the opposite side of the body. In two weeks the patient is allowed to assume a half-sitting position in bed.

Removal of the Stitches.—The stitches in the abdominal wall are removed at the end of the second week, and the line of incision covered with sterilized gauze, held in position with a strip of adhesive plaster.

The Bandage.—I instruct my patients to wear a bandage for one year. It is made

of Canton flannel cut to fit the figure closely, and held securely in position with straps. A bandage cannot ordinarily support the line of incision or prevent the formation of a ventral hernia, but I believe it to be of service when any great strain is put upon the abdominal walls.

Opium.—Morphia is not administered, if it can be avoided, on account of its tendency to unsettle the stomach and make the bowels sluggish. Nevertheless, when the pain following section is unusually severe, a hypodermic injection of morphia, $\frac{1}{8}$ grain, is given, and repeated if necessary. Under these circumstances the slight harm resulting from the use of the drug is more than overbalanced by the good obtained in preventing the exhaustion and depression dependent upon severe suffering.

3. THE ANTISEPTIC PREPARATION OF THE SURGEON AND HIS ASSISTANTS.

A daily general bath with a change of linen and underclothes secures personal cleanliness on the part of the operator and the assistants.

The dresses worn by the nurses are made of a material which may be washed, and are put on clean before the operation. The nurses have the forearms bare to the elbow, instead of wearing the linen sleeves in general use.

The operator and his assistants wear sterilized gowns extending from the neck to the feet.

The finger-nails are kept short and clean. The hands and forearms are first scrubbed with an aseptic hand-brush for from five to ten minutes in hot water and soap. They are then bathed actively in alcohol, after which they are soaked for one minute in a 1 to 1000 solution of bichloride. Finally they are washed in sterilized water. After the hands have been thus prepared, should they come in contact with anything that is not sterile, they are quickly cleaned with the brush in hot water and soap, and then passed through the processes of sterilization just mentioned.

4. THE OPERATING-ROOM.

The gynecological operations are performed in a room specially built, under the directions of myself and Dr. Thomas B.

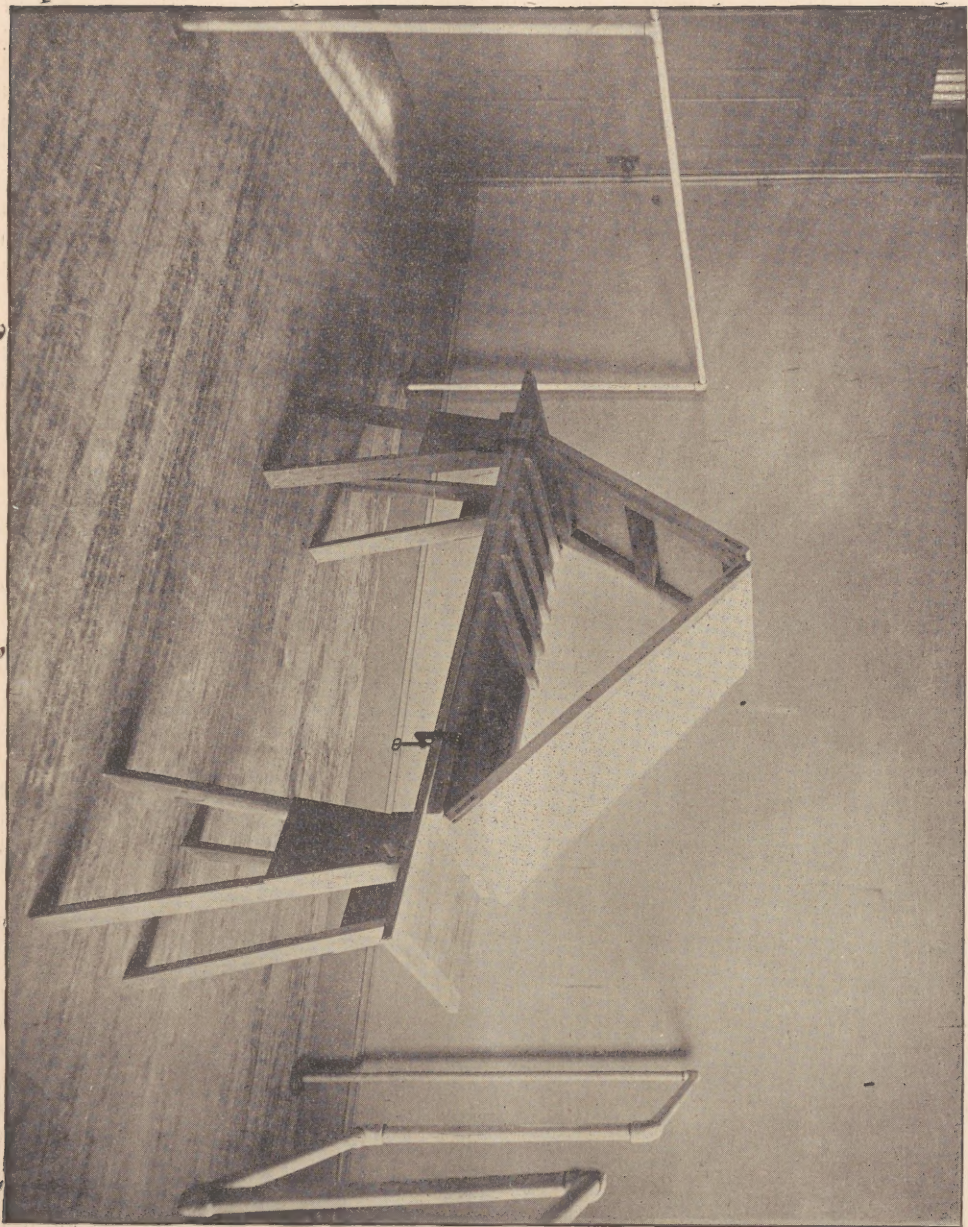


FIG. 3.—The operating-table and Trendelenburg rack. At each end are seen portions of the railing enclosing the field of operation.

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Earley, Demonstrator of Gynæcology, to conform with the principles of modern asepsis. As a description of this room would be tedious and unsatisfactory reading, I have had the accompanying photographs taken, which give a clear idea of its interior arrangement. One corner of the room is used for sterilization. There are two large iron tanks, resting upon tripods, which contain an abundance of sterile water. The water in one of the tanks, at the time of operation, is cold, in the other it is boiling; large gas-stoves supply the necessary heat. Placed next to the water-tanks is a large Arnold sterilizer, and beyond it a gas-stove for heating the water used in sterilizing the ligatures and instruments. In the opposite corner of the same end of the room are a number of hardwood shelves, upon which are kept the trays, basins, pitchers, rubber-sheeting, muslin sheets, gowns, etc. On other shelves are placed nine large and four small glass jars containing the following:—

1. Eighteen dozen gauze sponges.
2. Two dozen small gauze pads.
3. Two dozen large gauze pads.
4. Five dozen towels.
5. Iodoform gauze for drainage.
6. The dressings.
7. Rubber and glass drainage-tubes, rubber ligatures for the intestines, and rubber dam.
8. The irrigator.
9. Hand-brushes.
10. No. 2 braided silk.
11. No. 7 braided silk.
12. No. 12 braided silk.
13. Silk-worm gut.

Jars Nos. 7 and 8 are filled with a 10-per-cent. solution of carbolic acid. The various articles which they contain are previously rendered sterile by first washing in hot water and soap, then soaking for ten minutes in sublimate solution (1 to 500), and finally rinsing them thoroughly in sterile water. At the time of an operation, they are taken out of the jars, placed in basins, and boiling water poured over them.

The operating-table consists of a trestle, upon which is fastened a Trendelenburg rack, which may be elevated during the operation, if required. Placed on each side of the operating-table is a long table for the instruments, ligatures, gauze, water, etc. These tables are each six feet long by twenty inches wide, made of galvanized-iron pipe with movable, heavy glass tops,

which are scrubbed with hot water and soap and then washed with bichloride solution before each operation. Over the operating-table are placed sterilized sheets, thus giving an aseptic covering for the patient to lie upon.

The scheme of the operation is as follows: The operator and his second assistant, Dr. G. H. Richardson, stand to the left of the patient; while the first assistant, Dr. Thomas B. Earley, and the nurse are to the right. Upon the table, back of the operator, are placed the instruments, ligatures, and sterilized water for washing the hands. The second assistant attends to the instruments and ligatures. Upon the table, back of the first assistant, are placed the gauze for drainage, the dressings, the irrigator, the gauze sponges and pads, extra sterilized towels, and sterile water. The nurse looks after the sponges and pads and hands the assistant whatever is needed during the operation. A second nurse attends entirely to the sterile water, refilling the basins from time to time, and mixing the irrigating water.

A heavy galvanized-iron railing incloses the field of operation, and also that portion of the room in which the sterilizing is done and the supplies kept. There is, consequently, no danger of infection by contact with any spectator who may be present, as no one is allowed within the inclosures. I have found these railings of special advantage when operating upon clinical cases before students, and also when holding ward classes.

5. THE INSTRUMENTS, LIGATURES, SUTURES, GAUZE, BRUSHES, AND DRESSINGS.

The Instruments.—The instruments and needles after an operation are washed in cold water, then scrubbed in hot water and soap, and finally placed in boiling water. They are then dried and put into a clean receptacle. When needed again they are placed in a tray containing a solution of washing soda (a heaping tablespoonful to the quart) and boiled for fifteen minutes. The tray is then removed from off the stove and placed upon the instrument-table, and covered with a sterile towel.

Ligatures and Sutures.—Silk and silk-worm gut are used. Of the former, I have

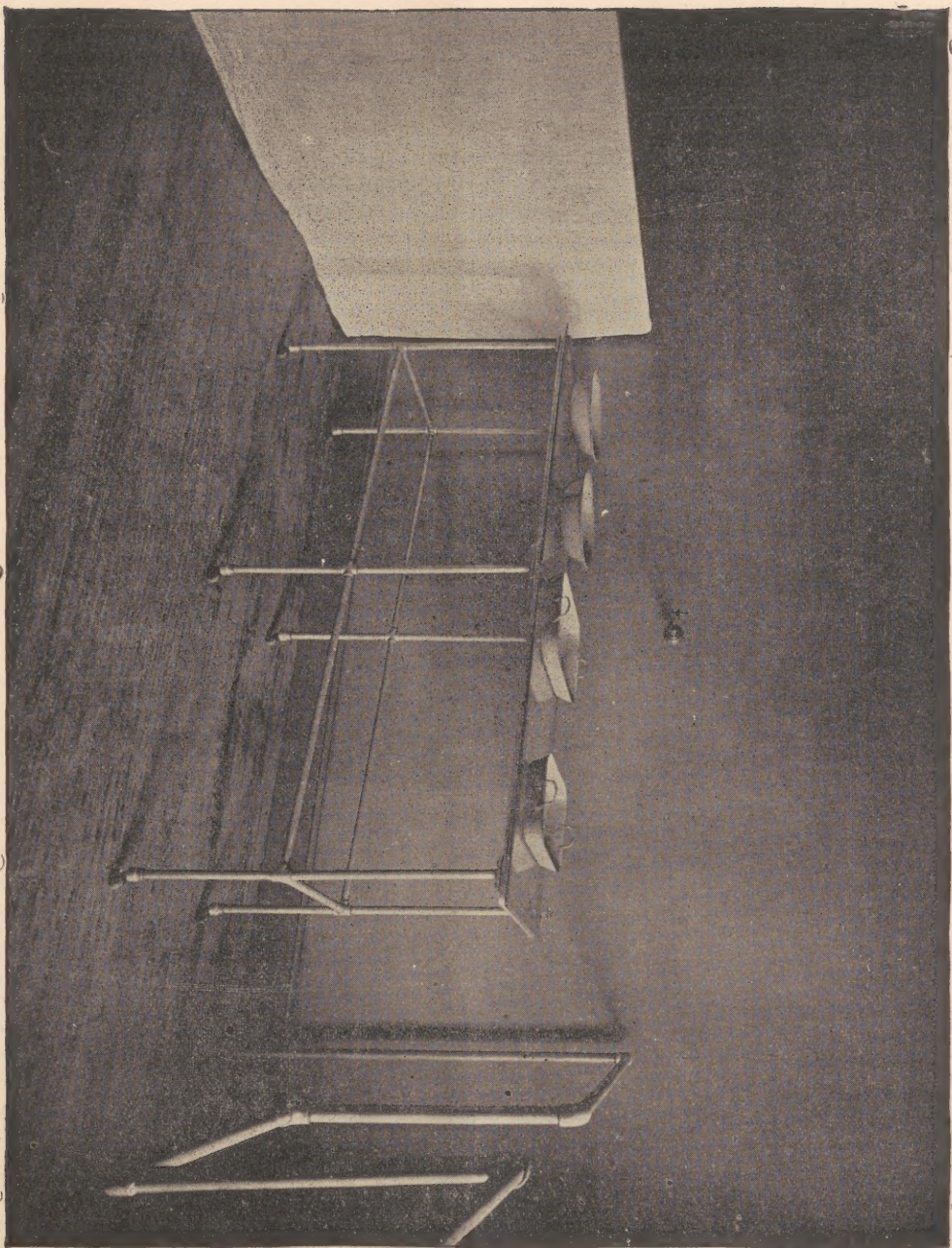
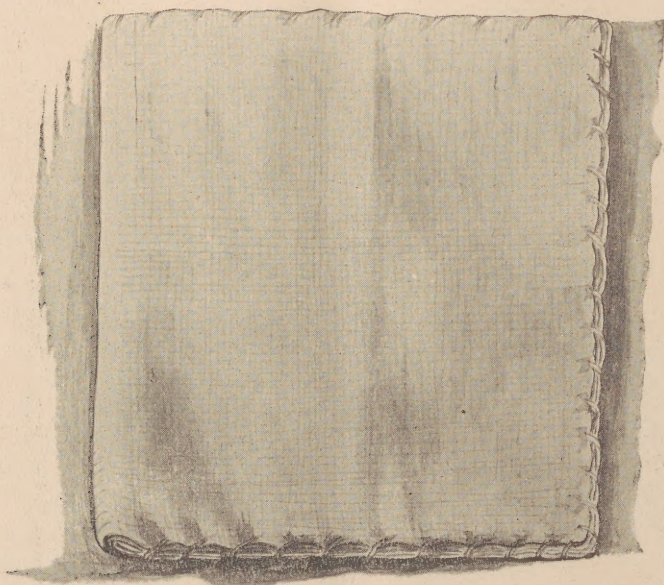


FIG. 4.—One of the glass-top tables upon which are placed the trays and basins.

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found that Nos. 2, 7, and 12, braided silk (manufactured by J. Ellwood Lee Co., Conshohocken, Pa.) answer all my purposes. The silk-worm gut I use exclusively for suturing the abdominal incision. A large supply of ligatures and sutures are kept on hand, in an aseptic condition, ready for use. The silk, after being cut into the following lengths, is wound upon glass spools: No. 12, twenty-eight inches; Nos. 2 and 7, each three feet. These spools are boiled in water for thirty minutes and then placed in glass jars containing alcohol for preservation. The silk-worm gut is also sterilized

cases. Each pad is composed of sixteen layers of gauze, folded together in such a manner that the edges cannot fray. The large pad is made as follows: A single layer of gauze a yard square is folded at each extremity upon itself, so that the folds meet at the middle. This makes two layers of gauze, oblong in shape, the extremities of which are now folded over so that they meet in the middle. There are now four layers, and the shape of the pad is square. This is then folded upon itself, making again an oblong pad, having eight layers. Folding it once more upon itself, the pad



THE WRITER'S GAUZE PAD.

by boiling, and then placed in alcohol. When the sutures and ligatures are needed, at the time of an operation, they are taken out of the jars with a long pair of sterilized forceps and placed in a tray containing boiling water.

Gauze.—Under this heading is included the pads, the sponges, and the drainage material:—

“The pads are made of the ordinary un-sized absorbent gauze in use in all hospitals for surgical dressings. I employ two sizes: a large pad, nine inches square, which is used in abdominal work, and a small one, four and one-half inches square, for pelvic

is then composed of sixteen layers and measures nine inches square. To keep the pad in shape and the layers from becoming separated the edges are stitched together with ordinary sewing cotton. The small pad is made in a precisely similar manner, except that a piece of gauze eighteen inches square is used.

“The advantages of these pads over sponges are very great. Flat sponges are not only expensive, but it requires great care and trouble to render them aseptic. Again, they can be used only a few times, as the chemical processes through which they must pass in cleaning after an opera-



FIG. 5.—The hard-wood shelves containing supplies: upon the upper shelf are the gauze pads and sponges, the towels, the hand brushes, and the ligatures and sutures; upon the lower shelf are the dressings, the iodoform gauze, the rubber and glass drainage-tubes, rubber ligatures and dam, and the irrigating apparatus.

tion render them rotten and unfit for use. Indeed, it is a serious question—one that for myself I have long since decided in the negative—if a sponge should ever be used a second time in abdominal work. Certainly, the best results are obtained in this branch of surgery by those operators who are extravagant in the use of their materials, and who never use ligatures or sponges left from a previous operation. Finally, sponges necessarily swell when brought in contact with fluids, and consequently they do not remain well in the position in which they are placed. On the other hand, gauze pads are inexpensive, the material costing only two and three-quarter cents a yard; they are readily made, and easily rendered aseptic by simply placing them in a steam-sterilizer for forty-five minutes prior to using them. Again, they remain well in place, as they retain their shape perfectly, and are much easier to pack about the seat of operation than are sponges.” *

The sponges are made of gauze which is cut into strips (nine by eighteen inches).

* “Pads of Absorbent Gauze as a Substitute for Flat Sponges in Abdominal Surgery,” Ashton. The Medical News, February 20, 1892.

These are arranged in bundles of twelve sponges each, and placed in a glass jar until needed.

Iodoform gauze is employed for drainage except when glass tubes are used. The gauze is cut into pieces a yard square each and kept in a glass jar.

Brushes.—The hand-brushes are kept in a glass jar, but are not sterilized until needed for use. They are not used a second time.

The Dressings.—These consist of plain gauze, a bandage of Canton flannel, and safety-pins, which are folded together in a towel and placed in a jar.

To prepare for an operation, four small and two large pads, twelve sponges, one hand-brush, a yard of iodoform gauze, eighteen towels, and a set of dressings are taken out of the jars and placed in the steam-sterilizer for one hour.

In conclusion, I will state that the cardinal principles upon which success depends in abdominal and pelvic surgery are, first, practical asepsis; second, rapid and complete operations; and, third, a careful preparatory and post-operative treatment.



FIG. 6.—The pitchers, trays, basins, kettle for boiling ligatures and sutures, the gowns, the sheets, etc.
The table under the first shelf is covered with a sterile sheet.

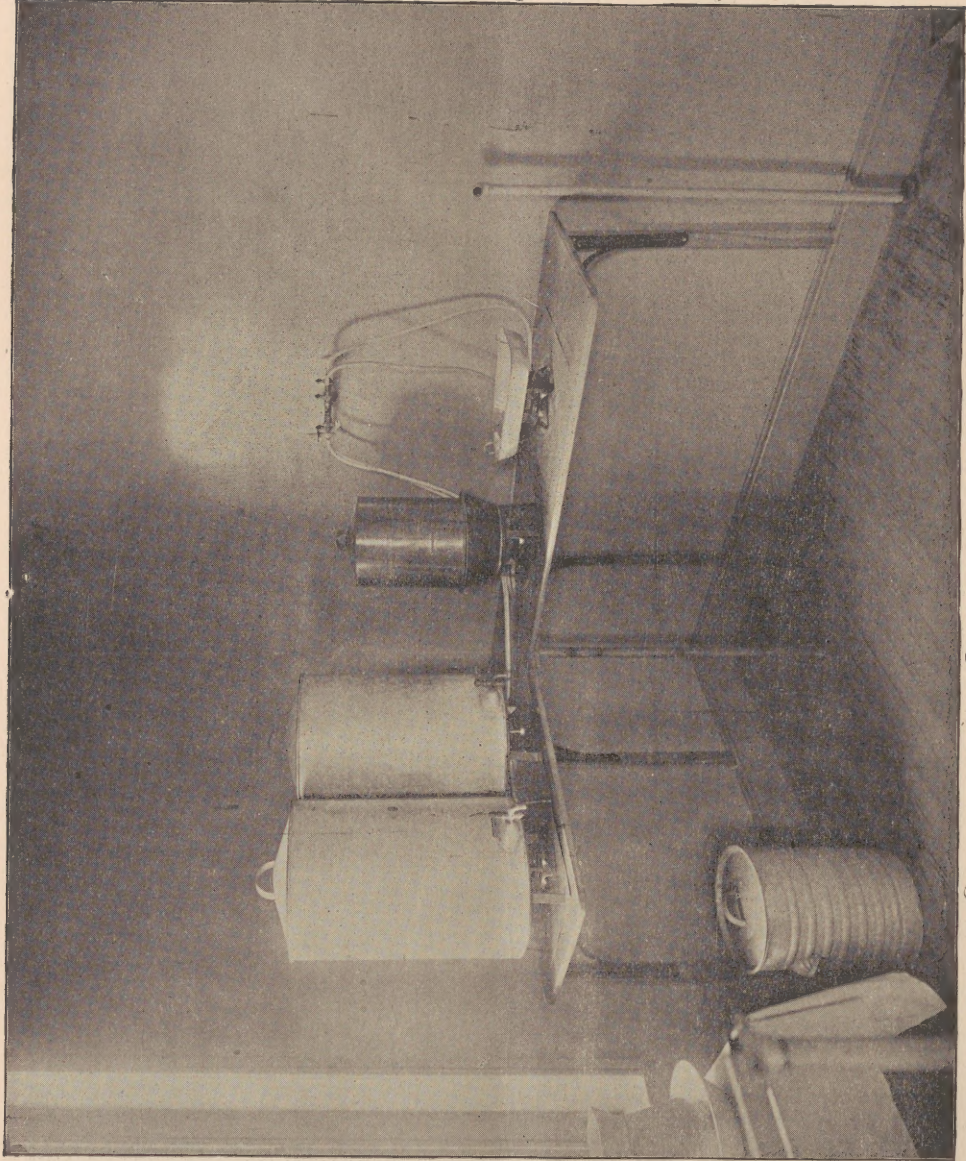
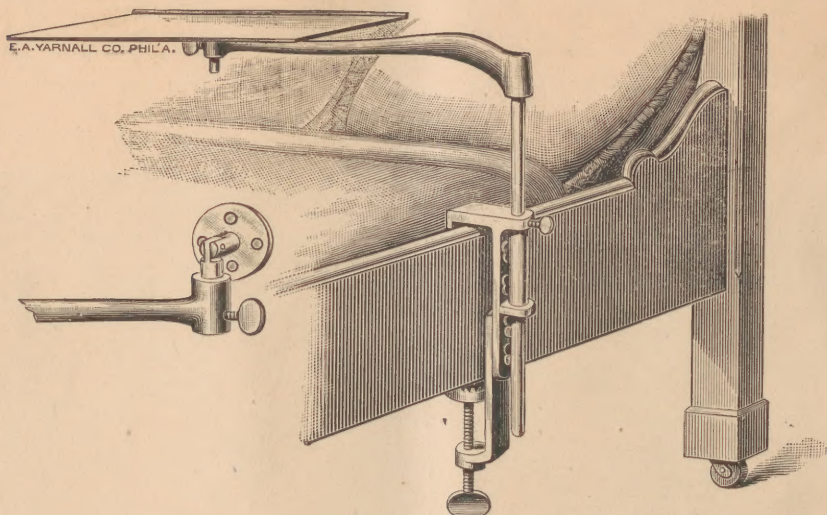


FIG. 7.—The hot and cold sterilized water tanks; Arnold's steam sterilizer and the gas-stove upon which the tray is placed for boiling instruments.

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